

a housing having a housing surface along an upper face of the housing and a well extending in to the housing through the housing surface, wherein the housing is arranged to support the force sensing element within the well so that the element surface and the housing surface are substantially coplanar to each other.

10 (amended). The sensor package of claim [5] 6 wherein the shelf is arranged to prevent the conductive adhesive from migrating around an edge of the sensing element and causing sensing element edge electrical shorting.

18 (amended). A sensor package comprising:

a force sensing element having an element surface along an upper face thereof; and

a housing having a housing surface along an upper face, a well, and first and second shelves within the well, wherein the first and second shelves of the housing are arranged to support the force sensing element so that the element surface and the housing surface are substantially coplanar to each other and so that the element surface and the housing surface face in a common direction.

25 (amended). A method of packaging a force sensing element having an upper element surface comprising the following steps:

- a) applying the force sensing element to a housing part having an upper external housing surface so that the upper element surface and the upper external housing surface are substantially coplanar to each other; and
- b) attaching the force sensing element to the housing.

REMARKS

This communication is responsive to the Final Office Action dated April 26, 2002. By this response, Applicant has amended independent claims 1, 18 and 25. Claims 1-29, a total of twenty-nine claims (3 independent and 26 dependent) remain pending in this

Application. Support for the amendments is found in the Specification and claims originally filed (e.g. at page 3, lines 11 and 16-17). No new matter is added by this Amendment. Although no fee is believed to be required for this response, the Commissioner is authorized to deduct any fees required by this Amendment (including any fees for extensions of time or additional claims) from Deposit Account 19-2814. **This response is being filed via facsimile only.**

The Final Office Action rejects all prior-pending claims under 35 U.S.C. § 112. Applicant has amended the subject language to clarify that the upper element surface and the upper housing surface are substantially coplanar to each other. Reconsideration of the rejections is requested.

The Final Office Action also rejects claims 1-5, 11, 18-19 and 25-29 under 35 U.S.C. § 103, citing US Patent No. 6,040,625 ("Ip"). The Final Office Action notes that the Ip reference fails to disclose that the element surface and the housing surface are substantially coplanar, as recited in each of the independent claims. Nevertheless, the Final Office Action states that it would have been obvious to remove the spring element in the Ip sensor to arrive at the present invention. Applicant respectfully traverses the rejection in that (1) there is no suggestion in Ip or elsewhere to remove the spring; (2) even if the spring were removed, the Ip reference would not disclose the claimed invention; and (3) several benefits result from the coplanar design, as set forth in the Specification.

There is no suggestion whatsoever for the modification proposed by the Final Office Action. The Office contends that "Applicant has not disclosed that removing the spring element solves any stated problem or is for any particular purpose and it appears that the

invention would perform equally well with no spring element". As a preliminary matter, it is well-settled that the Office bears the burden to prove that the proposed combination is obvious; it is not Applicant's obligation to prove to the contrary. Nevertheless, upon review of the Ip reference, it is clear that the proposed modification would not be obvious. First, the Ip reference does not describe a force sensor at all, but rather an accelerometer (see abstract, lines 3-6 and col. 1, lines 37-45) that functions in a completely different fashion from the presently claimed sensor (see Ip col. 1, lines 18-47). Accordingly, the Ip reference is non-analogous art that would not be readily modifiable to arrive at the present invention without the benefit of impermissible hindsight.

In particular, the Ip reference makes no express or implied suggestion that the spring element could be eliminated or that the spring is in any way superfluous, as suggested by the Office Action. To the contrary, the spring element (32) is described as an inherent component in the Ip sensor, as evidenced by its appearance in Figures 1, 4, 5a, 5b, 5c and 8 and accompanying text (*see, e.g.*, Ip col. 6, lines 39-50). Besides positioning the accelerometer components in the sensor cavity, the spring acts as an electrical path from the proof mass to the outer contact (*see* Ip col. 7, lines 23-34; Fig. 5b; and col. 6, lines 59-62). Similarly, the top support spring (36) provides a conductive path between the sensor die and the gold plated top ring D (*see* Ip, col. 4, lines 37-40 and Fig. 5A). The Ip sensor would therefore not function without either of the springs because the sensor relies upon the springs both structurally and electrically. Because the Ip springs serve definite purposes (*e.g.* providing mechanical stability and electrical connectivity), it would not be obvious to modify the Ip reference as suggested by the Office Action since doing so would disable the sensor.

Accordingly, the statement in the Final Office Action that "it appears that the invention would perform equally well with no spring element" is entirely inaccurate.

Moreover, even if the spring were removed from the Ip reference, the resulting structure would not disclose that the element surface and the housing surface are substantially coplanar, as recited in each of the independent claims. If the center contact spring (32) and/or the top contact spring (36) were removed, it is not at all apparent that the sensor die (20) and the ceramic case (40) would have coplanar surfaces. Indeed, the existence of the springs within the Ip device points out that the dimensions of the sensor die must be smaller than the inner chamber of the case, or there would be no reason to support the sensor die with the springs. As best seen in the cross-sectional view in Figure 5A of the Ip reference, the components of sensor die 20 are not sized such that the element and housing surfaces could be coplanar in any form, even if the springs were removed. Accordingly, even the modification proposed by the Final Office Action would not anticipate the invention described by the present claims.

Further, the Final Office Action notes that "Applicant has not disclosed that removing the spring element solves any stated problem". Applicant respectfully replies that several exemplary advantages of the co-planar sensor are described on page 1, lines 15-27 of the Specification as originally filed.

Accordingly, Applicant respectfully asserts that it would not be obvious to even a person of ordinary skill in the art to modify the Ip reference to arrive at the present invention because: (1) the proposed changes to the Ip would disable the sensor; (2) even the suggested modifications would not disclose the presently claimed invention; and (3) the present

invention provides advantages over the prior art that would not be otherwise obtainable from the Ip sensor, particularly since Ip is an accelerometer and not a force sensor.

Applicant notes with appreciation that the Final Office Action indicates that claims 6-10, 12-17 and 20-24 have been indicated as allowable. Applicant has amended the independent claims from which these claims depend as described above, but has not otherwise amended any of the allowed claims. Accordingly, Applicant believes that these claims remain allowable.

Applicant therefore respectfully submits that the present application is in condition for allowance, and earnestly solicits a Notice of Allowance at the Examiner's earliest convenience. The Examiner is invited to telephone the undersigned if such would advance prosecution of this Application in any way, or if the present Amendment is not entered for any reason. The undersigned may be contacted via telephone at 602.382.6236, via facsimile at 602.382.6070, or via email at bacarlson@swlaw.com.

Dated this 26th day of June, 2002.

Respectfully submitted on behalf of assignee
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Clean Version of Amended Claims

1. A sensor package comprising:
a force sensing element having an element surface along an upper face of the force sensing element; and
a housing having a housing surface along an upper face of the housing and a well extending in to the housing through the housing surface, wherein the housing is arranged to support the force sensing element within the well so that the element surface and the housing surface are substantially coplanar to each other.
10. The sensor package of claim 6 wherein the shelf is arranged to prevent the conductive adhesive from migrating around an edge of the sensing element and causing sensing element edge electrical shorting.
18. A sensor package comprising:
a force sensing element having an element surface along an upper face thereof; and
a housing having a housing surface along an upper face, a well, and first and second shelves within the well, wherein the first and second shelves of the housing are arranged to support the force sensing element so that the element surface and the housing surface are substantially coplanar to each other and so that the element surface and the housing surface face in a common direction.
25. A method of packaging a force sensing element having an upper element surface comprising the following steps:
 - a) applying the force sensing element to a housing part having an upper external housing surface so that the upper element surface and the upper external housing surface are substantially coplanar to each other; and
 - b) attaching the force sensing element to the housing.